VIRGINIA DEPARTMENT OF GAME AND INLAND FISHERIES

SURVEILLANCE AND RESPONSE PLAN FOR HIGHLY PATHOGENIC AVIAN INFLUENZA 2006

VDGIF Avian Influenza Task Force

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INTRODUCTION AND BACKGROUND

Introduction

This plan has been written to establish guidelines for the surveillance and early detection of Asian H5N1 should it appear in Virginia in wild migratory bird populations. Also contained in this plan are guidelines for the response to an outbreak of Asian H5N1 if the virus is detected in wild migratory birds within Virginia. The U.S. Interagency Strategic Plan: An Early Detection System for Asian H5N1 Highly Pathogenic Avian Influenza in Wild Migratory Birds has been used as a basis for this plan. The Virginia Department of Game and Inland Fisheries (VDGIF) will work cooperatively with other state and federal agencies should such an outbreak occur to protect wildlife, human health, and domestic poultry.

Background and History

Avian influenza viruses (AIV) are Type A viruses associated with avian species, and are of increasing global importance because of potential impacts to human health, wild birds, and domestic poultry. Avian influenza viruses are considered endemic in wild populations of waterfowl and many other species of birds. There is much speculation regarding the spread of the Eurasian form of Avian influenza into North America through migratory birds and that the virus will mutate and affect humans, thus creating a source for an influenza pandemic. Many government agencies, including state and federal agencies in Virginia have responded to this fear and are implementing early detection systems to determine if and when the virus arrives.

Avian influenza viruses are classified into subtypes based on the presence of two proteins found on the surface of the virus, hemagglutinin (H) and neuraminidase (N). There are currently 16 H and 9 N recognized subtypes that have been isolated from wild birds, which can result in 144 possible combinations. In addition to subtypes, there are also two classifications for AIV, either “highly pathogenic” (HPAI) or “low pathogenic” (LPAI), which relate to their ability to cause mortality or morbidity in domestic poultry. Highly pathogenic influenza viruses are most recognized by their H5 and H7 subtypes, which are associated with highly pathogenic forms. However, not all H5 and H7 subtypes are always highly pathogenic. AIV recovered from wild birds in North America have representatives of both the H5 and H7 subtypes, but they are not HPAI nor have they been associated with mortality or morbidity in any wild bird species.

Wild birds are considered to be the natural reservoir for all 144 subtypes of avian influenza virus. Fecal contamination is assumed to be the primary mode of transmission and it is known that the virus can remain viable for extensive periods in cold, fresh water. Some of the subtypes of avian influenza have been known to mutate and affect specific mammal and domestic bird taxas (e.g., chickens, swine, and humans). There is inadequate information about the virulence of Asian H5N1 in wild bird species and its persistence in wild populations.

The Eurasian H5N1 AIV currently affecting humans was first detected in 1997, and is highly pathogenic (HPAI) to some birds, particularly domestic poultry, but this form is not easily transmitted to people. Human deaths that have been attributed to

Eurasian HPAI occurred in individuals that were highly exposed to infected poultry and/or raw poultry parts. In 2002-03, wild bird mortality in Hong Kong was attributed to the HPAI H5N1 virus. Additional outbreaks in wild birds also occurred in China in April 2005, and most recently spread throughout Asia, Africa, and Europe. Most isolations of AIV come from birds associated with water in the *Anseriformes* (ducks, geese, and swans) and *Charadriformes* (gulls, terns, and other shorebirds) orders. Prevalence rates in ducks usually peak in late summer to early fall, but outside of this period is usually less than 1%. In gulls and shorebirds, peak infection rates are associated with spring migration, but this can differ greatly between species.

SURVEILLANCE PLAN

Virginia is located in the middle of the Atlantic Flyway and contains a wide diversity of wetland habitats. These include the Chesapeake Bay and its associated rivers and marshes, Atlantic coastal salt marshes/bays along the Eastern Shore, and fresh and brackish water systems in Southeast Virginia including Back Bay, Dismal Swamp and associated drainages. These areas support several million birds, including waterfowl and waterbirds, which use these areas during migration, wintering or breeding periods.

Current risk assessments indicate that the most likely point of entry of HPAI H5N1 will be via Alaska as this area represents a unique case where major flyways systems cross continental boundaries (Asia and North America). In addition, because AIV is continuing to spread west into Europe, there is also concern that it could enter the US along the Atlantic Coast via Greenland. Consequently, AI surveillance in Virginia will focus on migrant and wintering bird species that migrate, or potentially migrate, from Alaska or the Greenland/Northeastern corridor, or species that may be in contact with species that migrate from these areas.

The Atlantic Flyway Council (AFC) has identified 34 species (or species groups) of waterfowl/waterbirds as priority species for HPAI H5N1 surveillance sampling along the Atlantic Coast. In addition, an ad hoc Avian Influenza Committee of the Atlantic Flyway Council Technical Section has been assembled to assist states in coordinating Avian Influenza monitoring activities. Many of the priority species can be found in Virginia during the fall or winter periods, and Virginia has been identified as a “Primary” sampling state for a number of these species. The sampling strategy calls for the collection of 100-200 samples from each of the target species. The goal for the VDGIF is to collect 800 samples in Virginia. The samples will be collected from live birds and from hunter-killed birds. In consultation with the USDA, the VDGIF has identified 5 potential target species in Virginia (listed below). Other species of waterfowl or shorebirds may be sampled if the opportunity arises and if there is a need for such samples on a regional or Flyway basis. A general description of the planned sampling activities is presented below and a more detailed description is presented in Appendix 1.

Table 1. List of species for HPAI H5N1 active surveillance in Virginia by the VDGIF.

Species	Live-bird Sampling	Hunter Killed
Greater snow goose	X	X
Atlantic brant	X	X
Tundra swan	X	X
Mute swan	X	X
Mallard	X	X

Active Surveillance of Live Wild Birds

This strategy incorporates sampling of live-captured, apparently healthy wild birds for the collection of cloacal swabs. Sampling efforts for live birds will begin in late August 2006 when birds from high risk areas begin to migrate into the State, and will continue throughout the fall and winter in areas where trapping can be conducted. Capture methods will include bait trapping, rocket netting, night-lighting with an airboat, and other methods where feasible.

VDGIF captures and marks (leg-bands) several waterfowl species as part of our annual population monitoring activities. These efforts will be enhanced to meet the sampling targets identified above. In addition, cooperation and assistance from other organizations, especially the US Fish and Wildlife Service and USFWS Refuges, will improve our ability to meet the target goals.

Target species that will be captured in the late summer - early fall time period include mute swans, mallards, and snow geese. Target species that will be live-captured later in the year include, brant, snow geese, and tundra swans. Live-sampling for some species could prove difficult depending on weather conditions and assistance available, and it may be more efficient to obtain samples for these species from hunter-killed birds.

AI testing of resident Canada geese will not be conducted in the summer of 2006 as our sampling effort will not begin until the fall 2006 migration period. If sampling efforts continue in the following year, resident Canada goose samples should be easy to obtain in the summer of 2007.

Active Surveillance of Hunter-harvested Birds

It will likely be easier to obtain larger numbers of samples for some target species (Atlantic brant, greater snow geese, mallards) from hunter-harvested birds than from live trapping efforts. However, getting sufficient numbers of samples from some target species, such as tundra swans, may be difficult because they are widely dispersed and are not harvested in very large numbers. A combination of hunter-killed and live-trapped samples may be needed in these situations.

Hunting seasons during which most target species are generally taken are held from November-January. Efforts will be made to collect samples early during the hunting season as the potential for detection of AI decreases as the winter progresses. Attempts will be made to distribute the sample across a broad geographic area if possible.

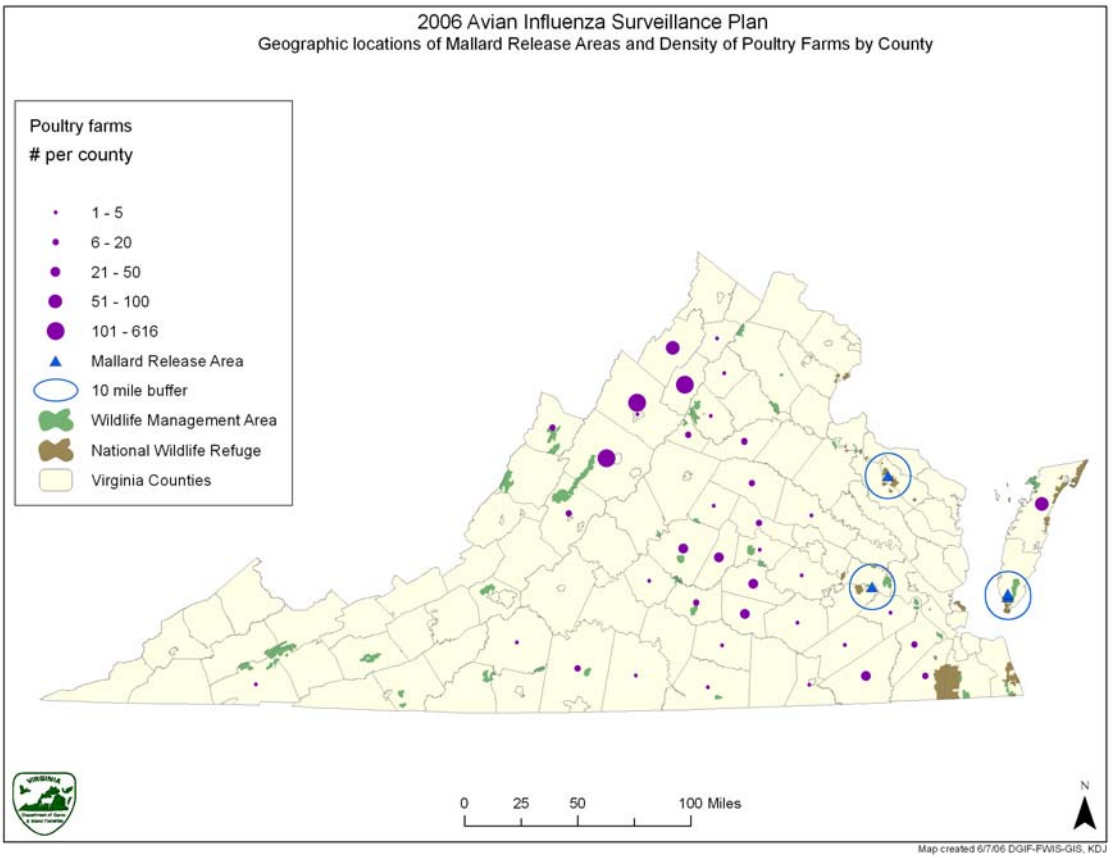
Hunter-harvested birds will be sampled by various means including: at hunter check stations, during field checks at boat ramps and public hunting areas, and through

contacts with waterfowl hunters and professional guides. The VDGIF operates a check station at the Hog Island Wildlife Management Area (Surry County), and conducts several other managed hunts where there is controlled access. Some samples from target species such as mallards and tundra swans could be collected at these State Wildlife Management Areas (WMA); however, the number of birds taken is not sufficient to meet sample needs. Additional efforts will be directed at areas where target species are most abundant and where the harvest on these species is greater. For example, efforts for collecting snow geese samples will be directed at the Eastern Shore and Back Bay; for brant on the Eastern Shore; and for tundra swans on the Northern Neck and in the Back Bay area. These efforts will include making contacts with local hunters and guides, and possibly setting up carcass collection or storage locations. In addition, law enforcement officers that routinely check waterfowl hunters could collect birds or could be trained to collect samples from hunter-killed birds. A good communications effort with local hunters will facilitate these collection efforts and will help accurately inform the public about AIV issues.

A scientific collection permit will be obtained from the USFWS for use during AIV sampling. VDGIF may conduct some collections to meet target goals, but such collections will be kept to a minimum. VDGIF will use live-capture and hunter-killed collection methods whenever possible.

Investigation of Morbidity and Mortality Reports (Targeted Surveillance)

The Eurasian strain of HPAI H5N1 is unusual as it has been documented to cause morbidity and mortality in wild birds. Consequently, we believe targeted surveillance of wild bird die-offs will provide the highest and earliest possibility of detection and will be the most cost-effective method of detecting the virus at this time. VDGIF will conduct targeted surveillance of the waterfowl and shorebird species by investigating any unusual morbidity and mortality events in these target species. Calls regarding wild bird mortality will be handled per the Interagency Call Tree for Reports of Dead Wild Birds (see Appendix 2). Once VDGIF receives a report of any unusual morbidity and mortality event in waterfowl or shorebirds it will be reported to the Wildlife Veterinarian. A routine disease outbreak investigation will be conducted and a representative sample of sick and dead birds will be collected and refrigerated until testing. In addition data such as onset, course, duration, distribution, species and environmental conditions will be recorded per the National Wildlife Health Center (NWHC) Specimen History Forms. Large die-offs of any species when the circumstances create a high index of suspicion that AIV may be a factor will also be investigated. Furthermore, any die-offs of bird species within a 10 mile radius of Mallard Release Area will also be investigated (see map below), as well as wild bird mortality events within counties that contain high densities of poultry operations (i.e., Accomack, Augusta, Page, Shenandoah, and Rockingham).



Captive Game Birds

Virginia Department of Agriculture and Consumer Services (VDACS) Avian Influenza Proclamation of June, 2005 requires that all imported game birds (bobwhite quail (*Colinus virgininianus*), ringneck pheasant (*Phasianus colchicus)*, chukar (*Alectoris chukar*) and migratory game birds, including all species of native ducks, geese as well as swans, must originate from flocks that have been tested by an accredited veterinarian using approved methods and laboratories for AIV within 10 days prior to shipment into Virginia. If the results are negative, VDACS will then issue a permit for importation.

VDGIF will require all importers of game bird species listed above to provide the VDACS importation certificate(s) prior to issuing or renewing any VDGIF permits, including but not limited to, applications for a permit to possess, propagate, buy and sell game bird species listed above, and all licensed shooting preserves including, but not limited to, Field Trial and Mallard Release Area permits. Any illegally imported game birds, or birds that have been imported without the appropriate VDACS importation will be reported to VDACS. VDGIF will work with VDACS to sample such flocks for AIV.

In addition, any unusual morbidity and mortality in any game bird flocks permitted by VDGIF will be reported to VDGIF within 24 hours so that an appropriate sample of sick and dead birds (minimum of 20) can be tested for AIV. The carcasses must be kept refrigerated until tested. In addition, a full history of the imported flock will be obtained as well as copies of all the relevant paperwork and medical records so that trace back and trace forward investigations can be conducted.

METHODOLOGY FOR TRACHEAL AND CLOACAL SAMPLING

1) Live birds, hunter-killed birds, and birds killed during nuisance abatement activities will be sampled for AIV using cloacal swabs with minimal fecal material. Tracheal and cloacal swabs will only be taken on birds that are sampled as part of a mortality event investigation. Unwrap a sterile swab from the package and insert the entire head of the swab into the trachea or cloaca. Using gentle pressure and in a circular motion, swab the inside circumference of the trachea/cloaca two or three times. For cloacal swabs, shake off large pieces of feces.
2) The swabs should be placed in **separate** brain-heart-infusion broth (BHI) tubes and labeled appropriately (see data collection section below). Do not pool samples into the same tube. Store the BHI broth in the refrigerator prior to use.
3) Each swab should be vigorously swirled to dislodge contents into the medium and the swab squeezed against the walls of the tube before removal. The tubes should be kept chilled (cold gel packs) while on over-night transit to laboratory. **Do not leave swab(s) in broth.**
4) Contain the specimens in a bag or other container to prevent leakage. Ensure that tubes are well packaged to prevent breakage and place absorbent material in the container or bag to soak up any leakage. Ship samples with a frozen refrigerant and use a sturdy outer container (box). It does not have to be a certified shipping box. All samples will be shipped overnight to the VDACS Animal Health Laboratory in Harrisonburg for PCR testing within 72 hours of collection.
5) A completed National Veterinary Services Laboratory (NVSL) submission form (10-4) should be included in the box with the samples that are not chickens, turkeys, quail or waterfowl. All PCR negative cloacal samples from the species not mentioned above will be forwarded to NVSL for virus isolation studies because of the reduced sensitivity of cloacal swabs. In addition, all positive samples will be sent to NVSL for confirmation.
6) Further diagnostics including, but not limited to, histopathologic and microbiologic investigations will be performed at the National Wildlife Health Center (NWHC) and the Southeastern Cooperative Wildlife Disease Study (SCWDS) as necessary.
7) Place used gloves and swabs in a plastic bag and dispose of in an appropriate trash receptacle, or incinerate.

DATA COLLECTION AND STORAGE

Data Collection

Data relating to the collection of tracheal and cloacal samples will be recorded at the collection site on preprinted VDGIF HPAI Surveillance Data Cards (Appendix 3) by the sample collector. Each data card will bear a pre-assigned unique Bird ID, as well as two unique Sample IDs. The Sample IDs will consist of the Bird ID followed by the letter T (for tracheal samples) or C (for cloacal samples). The card will include a series

of four detachable stickers imprinted with two of each of the Sample IDs. For each sample collected, one sticker will be applied to the body and one to the top of the sample tube at the time of the collection. Data will be recorded on each card as follows:

Bird Band ID: enter the USGS aluminum band ID if the bird is banded

Date of Death (if applicable): enter for hunter-killed birds, birds culled through nuisance abatement/managed take activities (for example, mute swans), and mortality events

Sample Date: date on which the tracheal/cloacal sample was collected

Sample Collector: first and last name of VDGIF employee collecting the tracheal/cloacal sample

Sample Type (check box): tracheal, cloacal

Sample Origin (check box): mortality event (samples collected during unusual morbidity/mortality events), hunter-killed (samples collected from hunter- harvested birds), managed take (samples collected from birds culled as a result of nuisance abatement activities, for example, mute swans), live bird (samples collected from live-captured, apparently healthy wild birds), captive flock (samples collected from captive bred game bird flocks)

Species:, Greater snow goose, Atlantic Brant, Tundra Swan, Mute Swan, Mallard, Canada Goose, other (specify - applicable to mortality events)

Sex (check box): Male, Female, Intersex, Not Provided, Undetermined

Age (check box): Hatch Year-Local, Hatch Year-Nestling, Hatch Year, Second Year, After Second Year, After Hatch Year, Not Provided, Undetermined

Place Name (include name of captive facility, if applicable): the place name should be a short descriptor of the site where a dead bird experienced mortality or where a live bird was captured (for example, name of refuge, WMA, marsh, or pond, or pond 3.4 mi N of Hopewell) and should be standardized as much as possible (for example, two samples taken from two different ponds within a WMA should be given the WMA name)

Location Description: refers to the site where a dead bird experienced mortality or where a live bird was captured; give address (if applicable), distance/direction to nearest town (for example, 5.2 mi SW of Fredericksburg), intersection, distance from or along a road, other useful information for determining location on a map

County/City of Origin: county/city where live bird was captured, or where bird was killed or found dead.

Location Coordinates (x, y): coordinates can represent a specific location (for example, GPS, or a pond within a WMA) or a generalized location (for example, a refuge); fill out either lat/long fields (use decimal degrees, with at least 5 digits following the decimal point - for example, 42.23456) or UTM fields below:

Lat (Y) (in Decimal Degrees)

Long (X) (in Decimal Degrees)

UTM (E) (ex. 987802)

UTM (N) (ex. 4218863)

Coordinate System (check box): UTM17, UTM18, Lat/Long, Other (specify)

Coordinate Descriptor: indicate whether the coordinates provided refer to a specific location (for example, GPS'd coordinates, pond within a WMA) or a more generalized location (for example, centroid of a WMA)

Sample Provider First Name

Sample Provider Middle Initial

Sample Provider Last Name

Sample Provider Address

Sample Provider City

Sample Provider State

Sample Provider Zip Code
Sample Provider Contact Phone

Data Storage

Once filled out, VDGIF HPAI Surveillance Data Cards will be mailed to the Wildlife Veterinarian in the VDGIF Richmond office by the sample collector. Data from the cards will be transcribed electronically, and the location of the harvest, mortality event, or capture of live birds contributing to the sampling will be stored and attributed in GIS. Processed data cards will be stored in a secure filing cabinet.

Data will be stored electronically in the Virginia HPAI Surveillance Database (VHSD). This database will consist of an Excel spreadsheet or Access database maintained by Wildlife Division personnel at the VDGIF Richmond office. The database structure will be based upon the Highly Pathogenic Avian Influenza Early Detection Data System (HEDDS) data entry spreadsheet provided by the National Wildlife Health Center (NWHC). VHSD will also allow for the storage of additional data collected by VDGIF through the VDGIF HPAI Surveillance Data Cards. VHSD will be designed so as to streamline the transfer of data into the HEDDS data entry spreadsheet for the purpose of periodic updates to HEDDS. The maintenance of VHSD as a separate database from HEDDS will enable VDGIF to retain control over the administration of Virginia data, while still allowing for the timely transfer, (i.e., within 24 hours of data collection) of data to the National Wildlife Health Center for inclusion into HEDDS.

In addition to the 800 random samples it will report to the NWHC, VDGIF may collect samples from captive bred game bird flocks and from dead birds associated with mortality events. Data from captive flock samples will not be transferred to the NWHC. A decision on whether to transfer to the Center data relating to mortality event samples has not been made at this time.

VHSD will consist of two worksheets (see below). Bolded fields indicate fields that will be used to store information collected by VDGIF that will not be stored in HEDDS. Note that data entry will be sample-based, rather than bird-based; thus, a tracheal and a cloacal sample from the same bird will receive two separate entries.

Animal Sample Data Entry

Data for HEDDS: data from captive flock samples, which will not be transferred to HEDDS, should be marked with a 'N' in this field. Data relating to mortality event samples should be marked with a 'Y' or 'N' in this field depending on the final decision on whether to transfer such data to HEDDS. All other data should be marked with a 'Y'.

Data transferred to HEDDS: this field will serve to track which data have been transferred to HEDDS if the data are transferred in batches. Mark with a 'Y" if data has been transferred.

Bird ID Type: enter 'Agency ID', as the Bird ID is assigned by VDGIF

Bird ID: alphanumeric

Sample ID: alphanumeric

Species

Sex: Male, Female, Intersex, Not Provided, Undetermined

VDGIF Age: Hatch Year-Local, Hatch Year-Nestling, Hatch Year, Second Year, After Second Year, After Hatch Year, Not Provided, Undetermined

HEDDS Age: Hatch Year-Local, Hatch Year-Nestling, Hatch Year, After Hatch Year, Not Provided, Undetermined (NOTE: VDGIF's 'Second Year' and 'After Second Year' categories are not supported by HEDDS – these should be recorded as After Hatch Year in this field)

Place Name: the place name should be a short descriptor of the harvest/mortality or live bird capture site (for example, name of refuge, WMA, marsh, or pond, or pond 3.4 mi N of Hopewell) and should be standardized as much as possible (for example, two samples taken from two different ponds within a WMA should be given the WMA name)

State: VA

County/City of Origin

Location Description

Lat (Y) (in Decimal Degrees)

Long (X) (in Decimal Degrees)

UTM (E)

UTM (N)

Coordinate System: UTM17, UTM18, Lat/Long, Other (specify)

Latitude (Decimal Degrees WGS84): convert the Y value to Decimal Degrees WGS84 for HEDDS

Longitude (Decimal Degrees WGS84): convert the X value to Decimal Degrees WGS84 for HEDDS

Coordinate Descriptor: indicate whether the coordinates provided refer to a specific location (for example, pond within a WMA) or a more generalized location (for example, centroid of a WMA)

Date Collected (same as *Sample Date* on card): mm/dd/yyyy

Sample Type: Tracheal Swab, Cloacal Swab, Serum, Feces, Water, Carcass

Submitter Name: (identical to *Sample Collector* on cards – format is first name last name)

Submitting Agency Name: VDGIF

Diagnostic Laboratory: Virginia Dept of Agriculture and Consumer Services, Animal Health Laboratory

Sample Strategy: Investigation Morbidity/ Mortality Events in Wild Birds, Surveillance in Live Wild Birds, Surveillance in Hunter Killed Birds, Sentinel Animals, Environmental Sampling – Water/ Feces (NOTE: VDGIF will track two additional categories, 'Captive Flock Sampling' and 'Managed Take' (to indicate sampling of culled mute swans).

Date of Death: mm/dd/yyyy

Sample Origin

Sample Provider First Name

Sample Provider Middle Initial

Sample Provider Last Name

Sample Provider Address

Sample Provider City

Sample Provider State

Sample Provider Zip Code

Sample Provider Contact Phone

Test Results Data Entry

Sample ID

Test Unique ID: will be assigned by the Harrisonburg laboratory

Test Type: Virus Isolation, RT – PCR (AI), RT – PCR (H5), RT - PCR (H7), ICPI, Serological Subtyping

Test Results: Positive, Negative, In Progress, Suspect, Rejected, Lost, Undetermined, Possibly all H/N combinations
Test Report Date: mm/dd/yyyy

LABORATORY REPORTING OF RESULTS

The testing plan is outlined in Appendix 4 (Wildlife Services AIV sample flowchart). Test results will be submitted to the NAHLN IT Systems. If a sample is positive for H5 or H7, the result will be considered presumptive positive until confirmed by additional testing at the NVSL. Presumptive positive results will be reported as required to state regulatory personnel. After confirmation by NVSL, results will be provided to the Interagency Operations Center, the submitting agency, and the submitting laboratory.

PERSONAL PROTECTION

All VDGIF staff who is in contact and handling wild birds potentially infected with AIV will follow the attached personal protection guidelines by the National Wildlife Health Center (Appendix 5). In areas where Eurasian H5N1 has been detected field personnel will follow the latest guidelines from the Centers for Disease Control and Prevention (CDC) (http://www/cdc/gov/flu/avian/professional/protect-guid.htm).

MEDIA COORDINATION AND COMMUNICATION

The VDGIF will provide accurate and timely information regarding Eurasian H5N1 to the media and public regarding the status of testing and surveillance in Virginia. The VDGIF currently has a well established working relationship with the VDACS and the Virginia Department of Health (VDH) regarding other diseases and their human impacts including, West Nile virus (WNV) and Chronic Wasting Disease (CWD). The VDGIF will continue to work cooperatively with these agencies, and other state and federal agencies involved in AIV activities to do the following:

Strategy a. Produce accurate and consistent information about the nature and status of Eurasian H5N1 in Virginia. Fact sheets and requests for assistance in identifying unusual disease events in the target species will be sent to waterfowl hunters, fishermen, and all conservation groups such as The Nature Conservancy.

Strategy b. Provide sound advice on the proper handling of birds through the use of handouts, the VDGIF Web site, and through the media.

Strategy c. Provide summaries of surveillance and detection efforts through the VDGIF Web site and press releases to the media.

Strategy d. Provide a Web site accessible to the public with information on avian influenza in Virginia with links to other important Web sites that provide information on a national and global level.

RESPONSE PLAN

1) Upon receiving notification of a preliminary positive sample from VDACS Laboratory, VDGIF will advise the Governor's Office and the Secretary of Natural Resources Office, VDACS, USDA, VDH and CDC that a preliminary positive case of HPAI H5N1 has been found in Virginia and that additional samples are being tested for confirmation at NVSL. The general public will be informed of a preliminary positive by a press release. Confirmation may take several days from the initial positive case notification. If the positive case is not confirmed, the Governor's and Secretary's offices will be notified and another press release will be written. No further actions will be taken.
2) HPAI is a reportable disease and all Eurasian HPAI H5N1 confirmed positive results will be immediately reported to the Virginia State Veterinarian, US Department of Agriculture Area (USDA) Veterinarian in Charge, USDA Wildlife Services, VDH and the CDC (see Appendix 6). Further responses will be coordinated with VDACS, VDH, CDC and USDA.
3) Concurrently, VDGIF will advise the Governor's Office and the Secretary of Natural Resources Office that a positive case of Eurasian HPAI H5N1 has been confirmed in a wild bird in Virginia.
4) Concurrently, intradepartmental notification will begin proceeding down the divisional chain of command. The regional manager of the area in which the HPAI H5N1 positive case has been found will be informed of the situation and advised of the response plan that will be enacted. VDGIF Media Relations will begin preparing a press release.
5) Concurrently, Department Directors or their designees will make calls to key constituency/stakeholder groups, including surrounding mid-Atlantic states, appropriate federal agencies, legislators, and local community officials where the HPAI H5N1 positive case was found, to inform them that HPAI H5N1 has been identified in Virginia and make them aware of the impending public announcement.
6) Emergency regulations will be enacted by the Board and VDGIF will establish a surveillance zone with 5-10 mile radius around the positive case. Sick and freshly dead birds will be targeted for surveillance and full diagnostic investigations will be conducted. Furthermore, additional active surveillance of the high risk species listed above may also be conducted. Surveillance will also be enhanced to include other avian species and some mammals such as felids and mustelids. Additional surveillance will continue for at least 30 days.
7) In addition, hunting seasons in the area of the outbreak may be modified and restrictions on the movement of all species of wild birds, carcasses and carcass parts out of the surveillance area may be imposed. The rehabilitation and release of all wild birds, including captive bred mallards and other game birds, in the surveillance zone will be suspended. Efforts will be made to reduce artificial congregations of birds.
8) The killing and removal of wild birds to control an epizootic disease outbreak is not an effective disease control procedure. Historically, attempts at these types of

control measures, when implemented, have not proven effective. Therefore, this will not be implemented as a control measure for avian influenza.

9) If a large mortality or morbidity event does occur and the affected birds are diagnosed with Eurasian H5N1, the following will occur:
    a) An area will be defined as a carcass disposal site.
    b) Carcass clean-up will be initiated according to the location and site specific needs.
    c) Carcasses will be collected in large, heavy-duty plastic bags.
    d) Carcasses can either be incinerated or buried based on the site specific needs.
    e) Decontamination of equipment and tools used to collect carcasses will consist of cleaning with a 10% chlorine bleach solution.

ACKNOWLEDGMENTS

This document was prepared by Bob Ellis, Assistant Director, Wildlife Division, Dr. Gary Costanzo, Migratory Game Bird Program Manager, Wildlife Division, Tom Bidrowski, Waterfowl Project Leader, Wildlife Division, Sergio Harding, Non Game Bird Conservation Biologist, Wildlife Diversity Division, and Dr. Jonathan Sleeman, Wildlife Veterinarian, Wildlife Division: Department of Game and Inland Fisheries.

Appendix 1.

Avian Influenza Work Plan

The VDGIF will collect 800 samples from migratory waterfowl during the fall and winter of 2006-2007. Sampling efforts for live birds will begin late this summer and in the fall when birds from high risk areas begin to migrate into the State. Capture methods will include molt round-ups, bait trapping, rocket netting, night-lighting with an airboat, and other methods where feasible. Sampling of hunter shot birds will begin in October and November with the opening of the duck season, and will continue through the end of the duck/goose hunting seasons in January/February. If sufficient numbers of samples have not been obtained by the end of the hunting season, live capture methods will be continued into February 2007. Samples will be collected predominantly from 5 target species of waterfowl (see below), and opportunistically from other species of concern.

Mute Swans (200 samples)
Mute swans are found in Virginia throughout the year and will be sampled during two general time periods: during the late summer/fall and during the December-January. In August and September, when mute swans are molting, they will be live-captured using boats to herd and round them up. These activities will be conducted on the Chesapeake Bay and on Inland ponds in the eastern portion of the state. The Swan Research Program at Airlie has access to over 100 mute swans under their observation and we will coordinate with them to obtain samples from these birds if needed. During the winter period, hunter shot birds will be sampled via bag checks on areas where mute swans concentrate. Mute swans are a nuisance species in Virginia and can be taken at any time of the year including the hunting season. Samples from mute swans will also be taken from birds collected under control activities.

Atlantic Brant (200 samples)
The majority of the samples for Atlantic brant will come from hunter shot birds. Most brant do not arrive in Virginia until November and peak numbers are not found in the state until December or January. In addition, the brant season generally does not open until December or January, so most samples will be collected during this time period. Brant are located predominantly on the seaside of the Eastern Shore, with a smaller component of birds using the Chesapeake Bay. Several hunting outfitters on the Eastern Shore target brant, and we will work with these outfitters to obtain samples. Samples from hunter-shot birds will be supplemented with samples from live-trapped birds if needed. VDGIF has live-trapped brant using rockets nets in the past on the Eastern Shore and at Langley Air Force base in the winter of 2005-2006. However, brant can be difficult to trap depending upon the weather, and live-trapping will be employed only if hunter shot samples prove difficult to obtain.

Greater Snow Geese (100 samples)
Snow geese generally do not arrive in Virginia until November and peak numbers may not be present until the winter. Like brant, the snow goose distribution in Virginia is somewhat limited. Most snow geese are found on the Eastern Shore or in the Back Bay

area. We will rely mostly on hunter shot birds to obtain this sample. Several outfitters/hunters on the Eastern Shore and in Back Bay will be contacted to obtain samples. However, the snow goose harvest in Virginia is not as consistent or reliable as the brant harvest, and live trapping efforts will likely be conducted along with hunter surveys. Trapping efforts on the Eastern Shore will be conducted at or near the Chincoteague National Wildlife Refuge. Snow geese congregate at Chincoteague in November and many remain there throughout the winter. Live trapping will be conducted with rocket nets and possibly swim-in funnel traps. One concern about live-trapping birds is that if bait is used to attract birds to a capture site, it could cause potential conflicts if the hunting season is underway. It may be possible to rocket net snow geese at Chincoteague on roosting sites without the use of bait. In addition, there are some private landowners that do not allow hunting on their property and it may be possible to trap birds using bait in these locations.

Tundra Swans (100 samples)

Similar to Atlantic brant and Greater snow geese, tundra swans generally do not arrive in Virginia in significant numbers until late November or December. Virginia offers a hunting season on tundra swans from December 1 through January 31 and we should be able to collect some samples from hunter shot birds during this time period. However, less than 200 swans are shot per year and the harvest is spread out over a large portion of the state. There are several swan concentrations areas where hunters are often successful and we will concentrate our sampling efforts in these locations. These areas include the Rappahannock River, the Potomac River and the Back Bay/Chesapeake areas. Samples from hunter shot birds will be supplemented with samples from live-trapped tundra swans. Areas to target for live trapping include the Rappahannock and Potomac River areas, Back Bay and the Hog Island Wildlife Management Area. Live trapping will be done predominantly with rocket nets. As with other trapping efforts, those for tundra swans may have to wait until the end of the hunting season so that baiting activities do not conflict with hunting seasons. Some trapping prior to February may be possible on areas not open to hunting.

Mallards (200 samples)

There are resident (breeding) mallards in Virginia as well as migrant birds that arrive in the fall and winter. Mallards are found throughout the eastern portion of the state and most samples will be collected from the major river drainages in the Chesapeake Bay watershed (Potomac, Rappahannock, York and James Rivers). Samples from mallards will be collected in the late summer/fall by live trapping and in the winter from hunter shot birds. Live trapping methods will include bait trapping, nightlighting with an airboat, and rocket netting. Hunter shot birds will be collected during the hunting season (November through January) from several areas including the Hog Island WMA on the James River, the Princess Anne WMA in Back Bay, and from hunt clubs on the Chickahominy, York and Pamunkey Rivers.

There are several Mallard Release Areas in Virginia that release pen-reared mallards for shooting. They are located on the Eastern Shore, the James River and the Rappahannock River. We may sample live or hunter shot mallards from these areas if trapping efforts do not provide enough samples.

Appendix 2.

COMMONWEALTH OF VIRGINIA

DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
DEPARTMENT OF GAME AND INLAND FISHERIES
DEPARTMENT OF HEALTH

CALL TREE FOR REPORTS OF DEAD WILD BIRDS

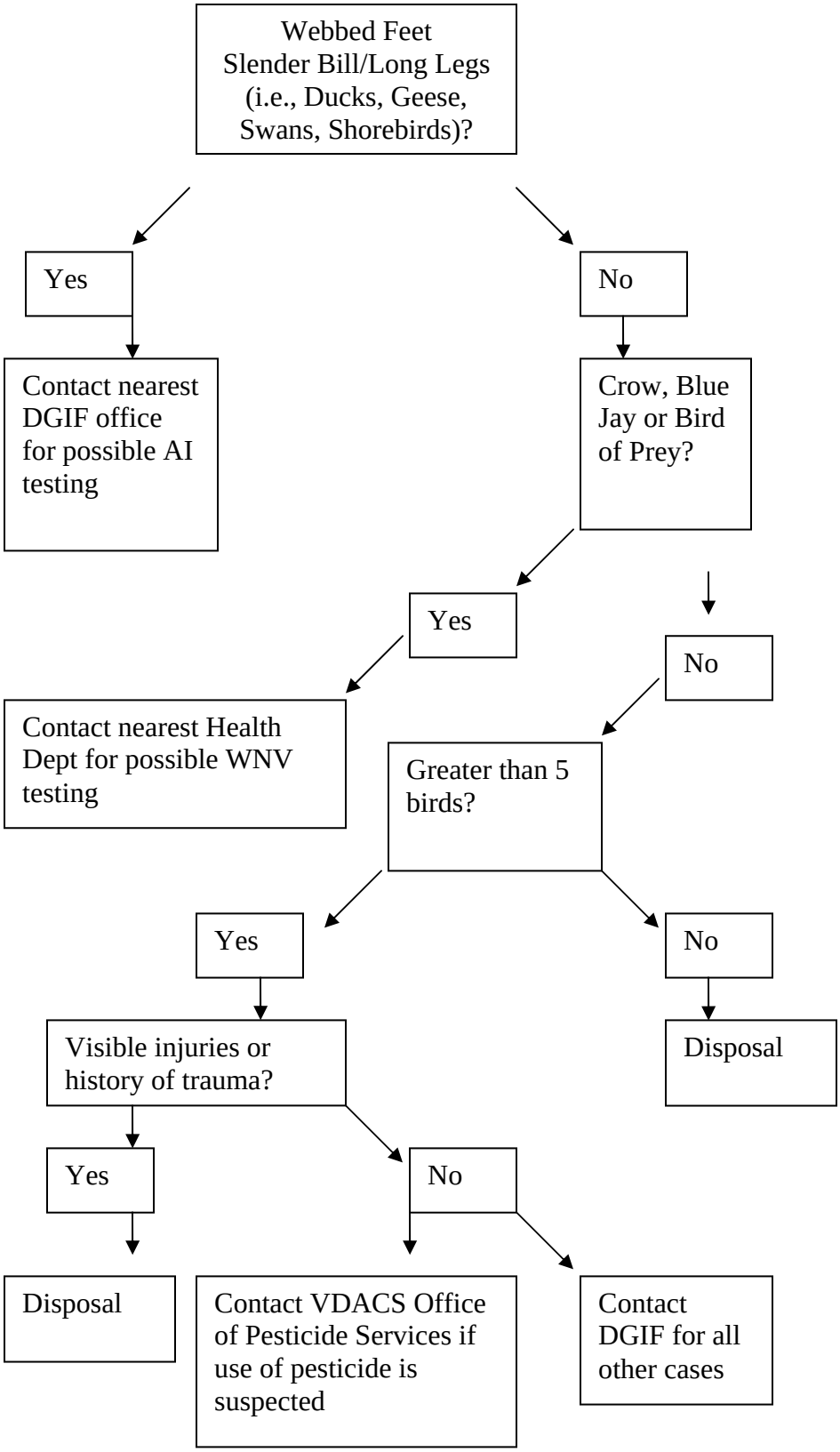
The following procedures should be followed when a call is received to report a dead bird:

1) Obtain caller information:
   a) Name.
   b) Address.
   c) Telephone number.

2) Obtain location: general to specific:
   a) State, county, zip code.
   b) Street address.
   c) Landowner name and telephone number.

3) Obtain number of dead birds found.
4) Habitat type (choose from wetland, wooded, riparian, grassland, urban/suburban).
5) Condition of the carcass(es).
6) Obtain description of the bird(s) from the caller: utilize the following decision tree on the following page.

Key: AI = Avian influenza
DGIF = Department of Game and Inland Fisheries
VDACS = Department of Agriculture and Consumer Services
WNV = West Nile virus


Webbed Feet
Slender Bill/Long Legs
(i.e., Ducks, Geese,
Swans, Shorebirds)?
Yes
No
Contact nearest
DGIF office
for possible AI
testing
Crow, Blue
Jay or Bird
of Prey?
Yes
No
Contact nearest Health
Dept for possible WNV
testing
Greater than 5
birds?
Yes
No
Visible injuries or
history of trauma?
Disposal
Yes
No
Disposal
Contact VDACS Office
of Pesticide Services if
use of pesticide is
suspected
Contact
DGIF for all
other cases

7) Diagnostic tests: DGIF is responsible for making the final determination whether cases should be tested for AI. The local Health Department is responsible for making the final determination whether cases should be tested for WNV. The VDACS Office of Pesticide Services is responsible for making the final determination whether cases should be tested for pesticide exposure. DGIF requests that the other agencies contact DGIF for further outbreak investigation if WNV and pesticide testing is negative.

8) Disposal: Advise the caller to handle the bird(s) with disposable gloves or a shovel to maintain a barrier, and place the bird in a trash bag or double shopping bag and tie off. The bird may then be placed in the garbage bin. Alternatively, the bird(s) may be buried but not in a plastic bag or cover. Advise the caller to wash his or her hands with warm water and soap, and clean the shovel with 10% bleach.

CONTACT INFORMATION

Department of Agriculture and Consumer Services

Robert E. Bailey, Department of Agriculture and Consumer Services, Office of Pesticide Services: (804) 371-6560

Department of Game and Inland Fisheries

Dispatch (804) 367-1258
Blacksburg (540) 961-8304
Farmville (434) 392-9645
Fredericksburg (540) 899-4169
Lynchburg (434) 525-7522
Marion (276) 783-4860
Verona (540) 248-9360
Williamsburg (804) 843 5962

Departments of Health

Visits www.vdh.virginia.gov and select the menu option "Local Health Districts" at the top of the page to find the local health department.

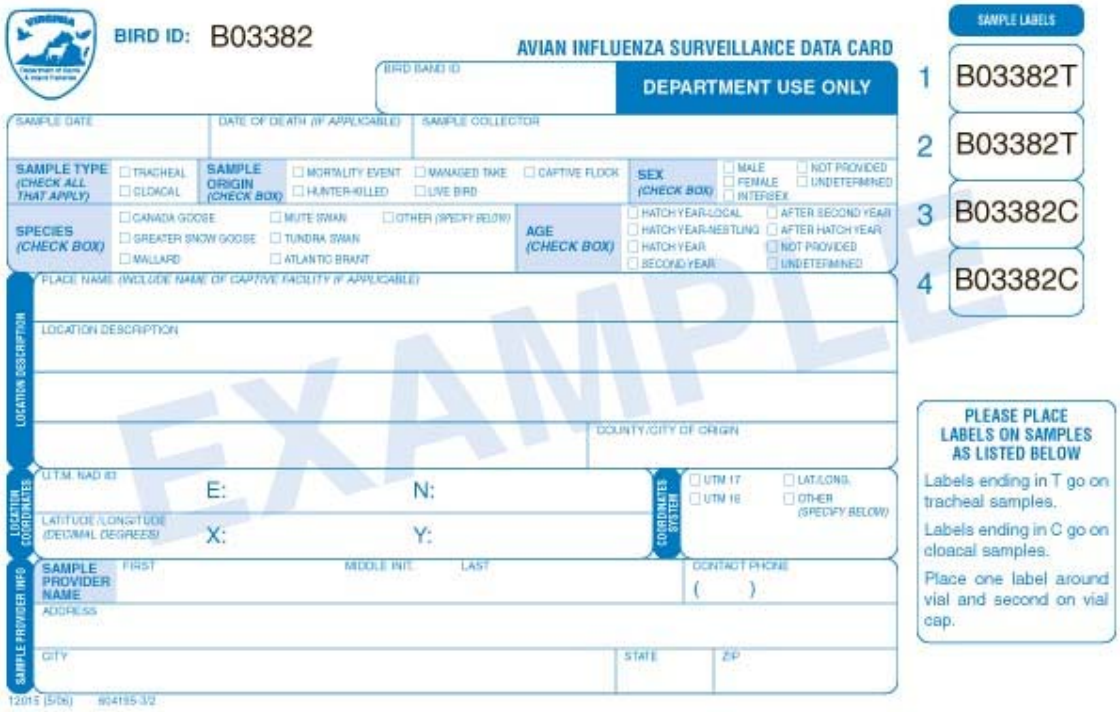
QUESTIONS REGARDING THIS DECISION TREE

Contact:

Dr. Julia Murphy, Department of Health: (804) 864-8113
Dr. Jonathan Sleeman, Department of Game and Inland Fisheries: (804) 367-9492
Dr. Joseph Garvin, Department of Agriculture and Consumer Services: (804) 692-0604

Appendix 3.

Example Data Card



BIRD ID: B03382

AVIAN INFLUENZA SURVEILLANCE DATA CARD

BIRD BAND ID

DEPARTMENT USE ONLY

SAMPLE DATE | DATE OF DEATH (IF APPLICABLE) | SAMPLE COLLECTOR

SAMPLE TYPE (CHECK ALL THAT APPLY): ☐ TRACHEAL ☐ CLOACAL

SAMPLE ORIGIN (CHECK BOX): ☐ MORTALITY EVENT ☐ MANAGED TAKE ☐ CAPTIVE FLOCK ☐ HUNTER-KILLED ☐ LIVE BIRD

SEX (CHECK BOX): ☐ MALE ☐ FEMALE ☐ INTERSEX ☐ NOT PROVIDED ☐ UNDETERMINED

SPECIES (CHECK BOX): ☐ CANADA GOOSE ☐ GREATER SNOW GOOSE ☐ MALLARD ☐ MUTE SWAN ☐ TUNDRA SWAN ☐ ATLANTIC BRANT ☐ OTHER (SPECIFY BELOW)

AGE (CHECK BOX): ☐ HATCH YEAR-LOCAL ☐ HATCH YEAR-NESTLING ☐ HATCH YEAR ☐ SECOND YEAR ☐ AFTER SECOND YEAR ☐ AFTER HATCH YEAR ☐ NOT PROVIDED ☐ UNDETERMINED

LOCATION DESCRIPTION

PLACE NAME (INCLUDE NAME OF CAPTIVE FACILITY IF APPLICABLE)

LOCATION DESCRIPTION

COUNTY/CITY OF ORIGIN

LOCATION COORDINATES

UTM, NAD 83 E: N:

LATITUDE/LONGITUDE (DECIMAL DEGREES) X: Y:

COORDINATES SYSTEM: ☐ UTM 17 ☐ UTM 18 ☐ LAT/LONG ☐ OTHER (SPECIFY BELOW)

SAMPLE PROVIDER INFO

SAMPLE PROVIDER NAME: FIRST | MIDDLE INIT. | LAST | CONTACT PHONE ( )

ADDRESS

CITY | STATE | ZIP

12015 (5/06) 804195-3/2

SAMPLE LABELS

1 B03382T

2 B03382T

3 B03382C

4 B03382C

PLEASE PLACE LABELS ON SAMPLES AS LISTED BELOW

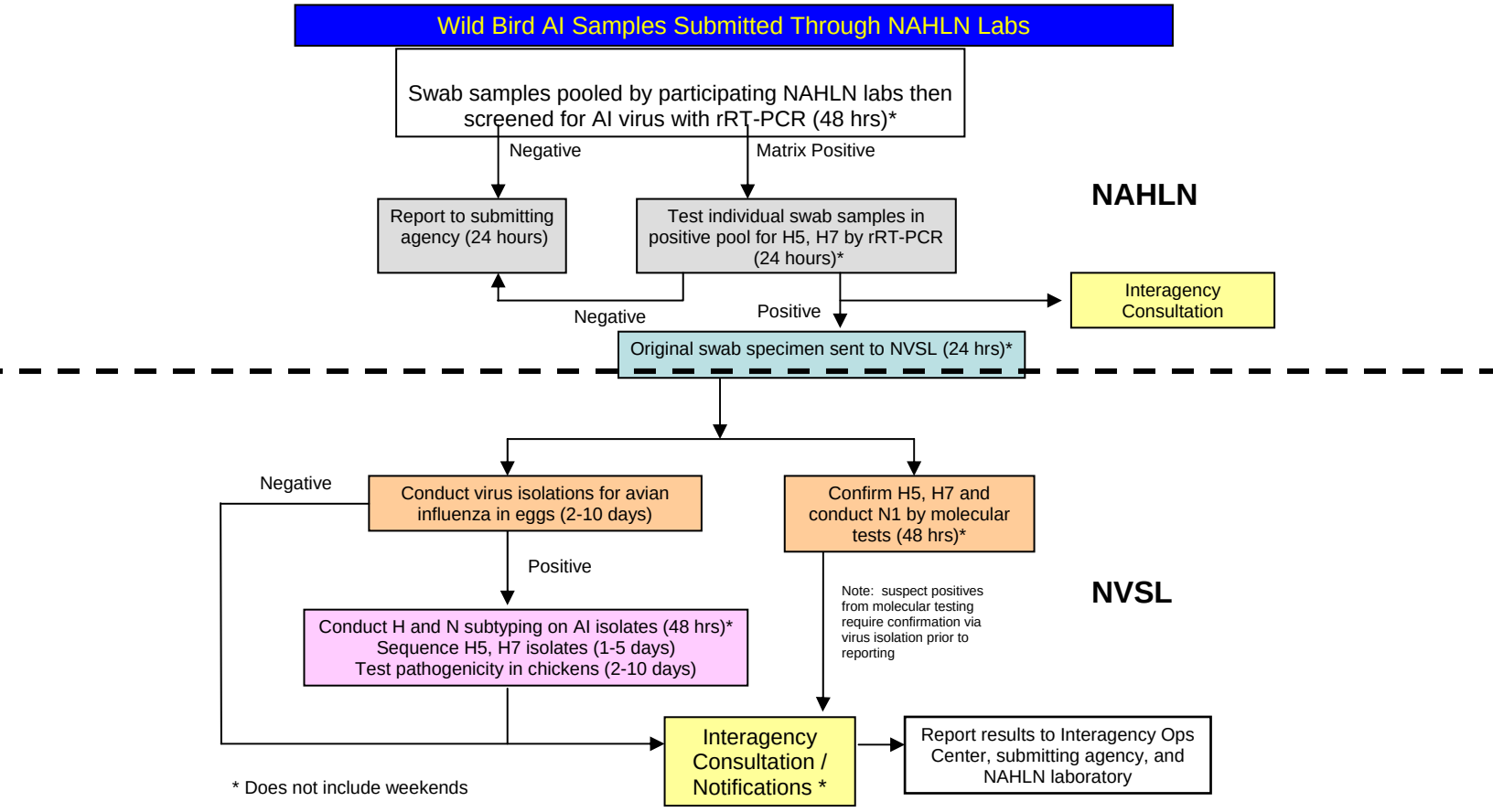
Labels ending in T go on tracheal samples.

Labels ending in C go on cloacal samples.

Place one label around vial and second on vial cap.

EXAMPLE

Appendix 4. Wildlife Services AIV Sample Flowchart.



Appendix 5.

Wildlife Health Bulletin 05-03

To: Natural Resource/Conservation Managers
From: Leslie Dierauf, Director, USGS National Wildlife Health Center
Title: Interim Guidelines for the Protection of Persons Handling Wild Birds With Reference to Highly Pathogenic Avian Influenza H5N1
Date: August 29, 2005

These Guidelines have been developed in consultation with the Centers for Disease Control and Prevention. They are advisory in nature and intended to provide guidance for field biologists and others working with or handling wild birds with specific reference to highly pathogenic avian influenza. The guidance reflects information available as of August 2005 and may be updated as more information becomes available.

Highly Pathogenic Avian Influenza H5N1

To date, Highly Pathogenic Avian Influenza A H5N1 has not been detected in humans, poultry or wild birds in North America and no data suggest that H5N1 should be suspected of being in North America or in wild birds migrating from Asia to North America this fall (2005).

Avian influenza, or bird flu, is a virus typically found in wild birds, especially waterfowl and shorebirds. The virus is only found in a small number of birds in the wild, and generally does not cause clinical signs of disease. The virus is shed in fecal droppings, saliva and nasal discharges. Since 2003, a particularly virulent strain of this virus has emerged in Asia—the highly pathogenic avian influenza (HPAI) H5N1 virus. The HPAI H5N1 virus probably originated from domestic poultry in that region and is of concern because: 1) it poses a threat to domestic poultry, especially chickens; and 2) it has caused illness in 112 persons, including the deaths of at least 57 people as of August 2005. Most human cases are thought to have become infected with the virus through direct handling of infected poultry, consumption of uncooked poultry products, or contact with virus-contaminated surfaces/materials. However, to date, the risk of H5N1 transmission to people through direct contact with infected poultry remains very low. Probable, limited person-to-person transmission of H5N1 viruses in a small number of cases has been reported.

There are an increasing number of reports that HPAI H5N1 is infecting and causing death in wild birds, including some migratory species. These events and the associated spread of the H5N1 virus to new geographical areas in Asia have created concerns and questions about the possibility that the H5N1 virus could be carried into North America in migratory birds.

These Guidelines provide advice about practices and precautions people should exercise to mitigate the risk of HPAI H5N1 viral infection based on the level of exposure to wild birds. Because situations can change quickly, we have included recommendations for handling wild birds in the event that HPAI H5N1 is detected. It is important to check with your respective public health, animal health, and natural resource agencies for up-to-date information on HPAI H5N1.

There is no known case where H5N1 has been transmitted from wild birds to humans. However, even apparently healthy wild birds can be infected with microorganisms other than HPAI, some of which are currently of more concern to human health in North America than HPAI H5N1.

Recommendations:

Thoroughly washing hands with soap and water (or with alcohol-based hand products if the hands are not visibly soiled) is a very effective method for inactivating influenza viruses, including HPAI. These viruses are also inactivated with many common disinfectants such as detergents, 10% household bleach, alcohol or other commercial disinfectants. The virus is more difficult to inactivate in organic material such as feces or soil.

The General Public should, as a general rule, observe wildlife, including wild birds, from a distance. This protects you from possible exposure to pathogens and minimizes disturbance to the animal.

- Avoid touching wildlife. If there is contact with wildlife do not rub eyes, eat, drink, or smoke before washing hands with soap and water as described above.
- Do not pick up diseased or dead wildlife. Contact your state, tribal or federal natural resource agency if a sick or dead animal is found.

Hunters should follow routine precautions when handling game.

- Do not handle or eat sick game.
- Wear rubber or disposable latex gloves while handling and cleaning game, wash hands as described above, and thoroughly clean knives, equipment and surfaces that come in contact with game.
- Do not eat, drink, or smoke while handling animals.
- All game should be thoroughly cooked (well done or 160^{o} F). Additional information can be found at: www.who.int/entity/foodsafety/fs_management/No_02_Avianinfluenza_Dec04_en.pdf .

Field Biologists handling apparently healthy wild birds in areas where HPAI H5N1 is not suspected should work in well-ventilated areas if working indoors. When working outdoors work upwind of animals, to the extent practical, to decrease the risk of inhaling aerosols such as dust, feathers, or dander.

- When possible, wear rubber or latex gloves that can be disinfected or discarded and protective eyewear or a face shield while handling animals.
- Wash hands often as described above, and disinfect work surfaces and equipment between sites.
- Do not eat, drink, or smoke while handling animals.

Field Biologists handling sick or dead birds associated with a mortality event should:

- Follow the recommendations above and at a minimum wear protective clothing, including coveralls, rubber boots, latex or rubber gloves that can be disinfected or discarded.
- Minimize exposure to mucosal membranes by wearing protective eyewear (goggles) and a particulate surgical mask (NIOSH N95 respirator/mask is preferable).
- Decontaminate work areas and properly dispose of potentially infectious material including carcasses. For additional Information see the USGS Field Guide to Wildlife Diseases: http://www.nwhc.usgs.gov/pub_metadata/field_manual/chapter_4.pdf
- Do not eat, drink, or smoke while handling animals.

Recommendations if HPAI is detected in North America

Field Biologists working with wild birds in areas where HPAI H5N1 has been detected, particularly during disease control operations, should consult with a health care provider and follow the latest guidelines from CDC and the WHO for prophylactic medications

and precautions for persons involved in avian influenza disease control:
http://www.who.int/entity/csr/disease/avian_influenza/guidelines/Avian%20Influenza.pdf
http://www.cdc.gov/flu/avian/professional/protect-guid.htm

- Follow the recommendations above and the basic guidelines for infection control, including how to put on and use, remove, disinfect or dispose of personal protective equipment and clothing.
- Wash hands frequently and disinfect exposed surfaces and field equipment between work sites.
- Do not eat, drink, or smoke while handling animals.
- Wear coveralls, gloves, shoe covers, or boots that can be disinfected or discarded, a respirator (NIOSH N95 respirator/mask is preferable) and protective eyewear (goggles).
- Monitor your health for clinical signs of influenza infection during and for one week after your last exposure to potentially HPAI virus-infected or exposed birds.
- Contact your healthcare provider if you develop fever, flu-like symptoms or conjunctivitis (eye inflammation). Inform them prior to arrival that you have potentially been exposed to HPAI.

Additional information about HPAI H5N1 can be found at the following Web links:
USGS National Wildlife Health Center:
http://www.nwhc.usgs.gov/research/avian_influenza/avian_influenza.html
Centers for Disease Control and Prevention: http://www.cdc.gov/flu/avian/index.htm

Appendix 6. Contact List for the Detection of Avian Influenza in Wild Migratory Birds

Organization or Agency	**Contact Name**	**Position**	**Contact Phone Number**	**Email address**
State Agencies				
VA Dept of Agriculture	Dr. Richard Wilkes	State Veterinarian	(804) 692-0601	Richard.Wilkes@vdacs.virginia.gov
VA Dept of Agriculture	Dr. David Cardin	Asst. State Veterinarian	(804) 692-0601	David.Cardin@vdacs.virginia.gov
VA Dept of Health	Dr. Julia Murphy	State Public Health Veterinarian	(804) 864-8113	Julia.Murphy@vdh.virginia.gov
VA Dept of Health	Dr. Susan Fischer Davis	Director, Division of Zoonotic and Environmental Epidemiology	(804) 864-8110	Susan.FischerDavis@vdh.virginia.gov
VA Dept of Game and Inland Fisheries	Bob Ellis	Assistant Director, Wildlife Division	(804) 367 6482	Bob.Ellis@dgif.virginia.gov
VA Dept of Game and Inland Fisheries	Dr. Jonathan Sleeman	Wildlife Veterinarian	(804) 367 9492	Jonathan.Sleeman@dgif.virginia.gov
Federal Agencies				
USDA-Wildlife Services	Martin Lowney	State Director	(804) 739-7739	Martin.S.Lowney@aphis.usda.gov
USDA-Veterinary Services	Dr. Terry Taylor	Area Veterinarian in Charge	(804) 343-2560	Terry.L.Taylor@aphis.usda.gov
USGS NWHC	Dr. Grace Mclaughlin	Wildlife Disease Specialist	(608) 270 2446	gmclaughlin@usgs.gov